Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

Q(β^-)=1408.2 *24*; S(n)=5946.0 *12*; S(p)=11530 *50*; Q(α)=−6260 *40* 2021Wa16
S(2n)=14760.7 *24*, S(2p)=21319 *3* (2021Wa16).
See (n,γ):resonances for neutron resonance data of 199 resonances.
Additional information 1.

^{123}Sn Levels

Cross Reference (XREF) Flags

A	^{123}In β^- decay (6.15 s)	F	^{122}Sn(d,pγ)	K	^{124}Sn(^{80}Se,Xγ)
B	^{123}In β^- decay (47.4 s)	G	^{122}Sn(α,^{3}He)	L	^{208}Pb(^{48}Ca,Xγ),^{238}U(^{48}Ca,Xγ)
C	^{122}Sn(n,γ) E=res	H	^{124}Sn(p,d)	M	^{238}U(^{12}C,Fγ),^{208}Pb(^{18}O,Fγ)
D	^{122}Sn(n,γ) E=thermal	I	^{124}Sn(p,d) IAR		
E	^{122}Sn(d,p)	J	^{124}Sn(d,t)		

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[‡]	11/2$^-$	129.2 d *5*	ABCDEFGH JKLM	%β^-=100 μ=−1.3700 *9* (1986An24) Q=+0.03 *4* (1986An24) J$^\pi$: spin from atomic beam laser spectroscopy (1986An24); π=− from L(d,p)=L(d,t)=5 from 0$^+$. T$_{1/2}$: weighted average of 129.0 d *5* (1966La13) and 129.6 d *6* (1968Er03). Others: 130 d *5* (1949Le05), 126 d *5* (1950Ne52), 125 d *3* (1951Co34). μ,Q: from thermal atomic beam LASER spectroscopy (1986An24). See also 2014StZZ and 2016St14 compilations. Nuclear rms charge radius=4.6665 fm *23* (2013An02).
24.6 *4*	3/2$^+$	40.06 min *2*	ABCDEF J	%β^-=100 Additional information 2. J$^\pi$: spin from atomic beam (1968Ch38); π=+ from L(d,p)=L(d,t)=2 from 0$^+$. T$_{1/2}$: weighted average of 40.06 m *1* (1990Ab06), 40.08 m *7* (1968Er03), 41.5 m *5* (1948Mo33), and 40 m *1* (1949Le05). Others: 41.8 m *5* (1977Ti03), 38.9 m *4* (1970OsZZ), 39.5 m (1949Du15).
150.4 *4*	1/2$^+$		BCDEF H J	XREF: H(139). J$^\pi$: L(d,p)=L(d,t)=L(p,d)=0 from 0$^+$.
618.88 *19*	(9/2)$^-$		A C EF J	XREF: J(?). J$^\pi$: 619.0γ M1,E2 to 11/2$^-$; 536.4γ from 7/2$^+$; possible β^- feeding from 9/2$^+$ parent; level systematics of 9/2$^-$ in odd Sn isotopes.
870.1 *5*	(5/2)$^+$		A C EF h	XREF: h(899). J$^\pi$: 719.5γ to 1/2$^+$, 284.7γ from 7/2$^+$, 1331γ from (9/2)$^+$. 1970Ca01 also suggest J=5/2 in (p,d) for a level at 899.
920.0 *5*	(3/2)$^+$		BCD F h J	XREF: h(899)J(930). J$^\pi$: 769.5γ M1 to 1/2$^+$; excitation function in (d,pγ) favors 3/2$^+$. Other: 1970Ca01 suggest J=5/2 in (p,d).
931.4 *5*	7/2$^-$		A C EF	J$^\pi$: L(d,p)=3 from 0$^+$;931.2γ E2 to 11/2$^-$.
1044.3 *5*	(7/2)$^+$	<0.1 ns	A EF H J	XREF: H(1028)J(1060). J$^\pi$: L(d,t)=4 and L(p,d)=(4) from 0$^+$; 1019.7γ to 3/2$^+$. T$_{1/2}$: from (β)(1019.7γ)(t) (1976Fo02) in ^{123}In β^- decay (6.15 s).
1072.0 *6*	(1/2,3/2)$^+$		C EF	J$^\pi$: 921.9γ M1+E2 to 1/2$^+$; primary 4873.9γ from 1/2 resonance state in (n,γ) E=res.

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Adopted Levels, Gammas (continued)

^{123}Sn Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
1107.04[&] *9*	(15/2$^-$)[@]		KLM	J$^{\pi}$: band assignment.
1109			E J	
1136.3 *8*	(1/2,3/2,5/2)$^+$		CDEF	J$^{\pi}$: 1112.0γ M1,E2 to 3/2$^+$; 985.5γ to 1/2$^+$.
1155.03 *14*	7/2$^+$	<0.1 ns	A E h J	XREF: h(1185). E(level): L=4 component of 1185 level in (p,d) suggest excitation of 1155 level. J$^{\pi}$: L(d,p)=L(d,t)=4 from 0$^+$; 1130.5γ E2 to 3/2$^+$. T$_{1/2}$: From (β)(1130.5γ)(t) (1976Fo02).
1194.6 *7*	(5/2)$^+$		BC EF h J	XREF: h(1185). J$^{\pi}$: L(d,p)=L(p,d)=L(d,t)=2 from 0$^+$; IAR of 15434, 5/2$^+$ level in ^{123}Sb in ^{122}Sn(pol p,p) IAR.
1217.07 *9*	(13/2$^-$)		KL	J$^{\pi}$: proposed in (^{48}Ca,Xγ) (2016Is03) and (^{80}Se,Xγ) (1994Ma48).
1301			E	
1440			E J	XREF: J(1451). E(level): from (d,p). 1451 level in (d,t) is tentative.
1466			E	
1488.8 *11*	(5/2)$^+$		EF H J	XREF: F(?)J(1500). J$^{\pi}$: L(d,p)=L(p,d)=L(d,t)=2 from 0$^+$; IAR of 15734, 5/2$^+$ level in ^{123}Sb in ^{122}Sn(pol p,p) IAR.
1714			E	
1729			E	
1780 *20*	3/2$^+$,5/2$^+$		E H J	E(level): from (d,t). Others: 1784 from (d,p), 1780 from (p,d). J$^{\pi}$: L(p,d)=L(d,t)=2 from 0$^+$; 1970Ca01 in (p,d) suggest J=5/2 from possible J-dependence of $\sigma(\theta)$.
1829	(1/2$^-$,3/2$^-$)		E	J$^{\pi}$: L(d,p)=(1) from 0$^+$.
1902	3/2$^+$,5/2$^+$		E H	J$^{\pi}$: L(p,d)=2 and L(d,p)=(2) from 0$^+$; 1970Ca01 in (p,d) suggest J=3/2 from possible J-dependence of $\sigma(\theta)$.
1926.09 *12*	(15/2$^+$)		KL	J$^{\pi}$: proposed in (^{48}Ca,Xγ). But (17/2$^-$) proposed in (^{80}Se,Xγ).
1944.89[a] *12*	(19/2$^+$)[@]	7.4 μs *26*	KLM	J$^{\pi}$: band assignment. T$_{1/2}$: from delayed γ to pulsed beam in (^{80}Se,Xγ) (1992Ma27).
2001.2 *5*	(9/2)$^+$		A E	J$^{\pi}$: allowed β^- feeding from 9/2$^+$ parent gives 7/2$^+$,9/2$^+$,11/2$^+$; 1131γ-719.5γ cascade to 1/2$^+$ disfavors 11/2$^+$; 2001.2γ to 11/2$^-$ disfavors 7/2$^+$.
2026	3/2$^+$,5/2$^+$		E H J	XREF: J(2010). E(level): from (d,p). Others: 2020 from (p,d), 2010 *20* from (d,t). J$^{\pi}$: L(p,d)=L(d,t)=2 from 0$^+$; 1970Ca01 in (p,d) suggest J=3/2 from possible J-dependence of $\sigma(\theta)$.
2085	3/2$^+$,5/2$^+$		E H j	XREF: H(2080)j(2100). J$^{\pi}$: L(p,d)=2 from 0$^+$; 1970Ca01 in (p,d) suggest J=5/2 from possible J-dependence of $\sigma(\theta)$.
2098.97 *19*	(19/2$^-$)[@]		L	
2114 *6*	(3/2$^+$,5/2$^+$)		E j	XREF: j(2100). J$^{\pi}$: L(d,t)=2 from 0$^+$ for a level at 2100 *20*.
2152.64[a] *19*	(23/2$^+$)[@]	6 μs	KLM	J$^{\pi}$: band assignment. T$_{1/2}$: from delayed γ versus beam pulse (1994Ma48,1995Da26) in (^{80}Se,Xγ). No ΔT$_{1/2}$ value have been given.
2156.0 *8*	(1/2,3/2,5/2)		CD	J$^{\pi}$: primary 3789.1γ from 3/2 resonance in (n,γ) E=res.
2157 *15*	(1/2,3/2,5/2)		E H J	XREF: H(2150)J(2167). J$^{\pi}$: L(d,p)=(1+2) from 0$^+$.
2260 *15*	1/2$^-$,3/2$^-$		E j	XREF: j(2271). J$^{\pi}$: L(d,p)=1 from 0$^+$.
2262.78[&] *20*	(19/2$^-$)[@]		KLM	J$^{\pi}$: band assignment.
2270	3/2$^+$,5/2$^+$		H j	XREF: j(2271).

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Adopted Levels, Gammas (continued)

^{123}Sn Levels (continued)

E(level)†	Jπ	$T_{1/2}$	XREF	Comments
				Jπ: L(p,d)=2 from 0^+; 1970Ca01 in (p,d) suggest J=$3/2^+$ from possible J-dependence of $\sigma(\theta)$.
2362 *15*	$7/2^+,9/2^+$		E H J	XREF: H(2350)J(2368). Jπ: L(p,d)=4 from 0^+.
2395.29 *18*	$(21/2^+)$@		KL	
2425	$1/2^+$		E H J	XREF: H(2410)J(2420). Jπ: L(p,d)=L(d,t)=0 from 0^+.
2446			E J	
2542.26& *19*	$(23/2^-)$@		KLM	Jπ: band assignment.
2615.2 *11*	$(1/2^+)$		C E h	XREF: C(?)h(2620). E(level): from (d,p). Other: 2615 *3* from (n,γ) E=res is questionable; 2620 from (p,d). Jπ: L(p,d)=0 for a level at 2620.
2621.0? *22*	$(1/2^+)$		BC h	XREF: C(?)h(2620). Jπ: L(p,d)=0 for a level at 2620.
2676	$5/2^-,7/2^-$		E J	XREF: J(2680). Jπ: L(d,p)=L(d,t)=3 from 0^+.
2712.3& *3*	$(27/2^-)$@	34 μs	KLM	Jπ: band assignment. $T_{1/2}$: from delayed γ versus beam pulse (1994Ma48,1995Da26) in (^{80}Se,Xγ). No $\Delta T_{1/2}$ value have been given.
2716 *15*	$(7/2)^-$		E	Jπ: L(d,p)=3 from 0^+; IAR of 16932, $7/2^-$ level in ^{123}Sb in ^{122}Sn(pol p,p) IAR.
2730	$7/2^+,9/2^+$		H	Jπ: L(p,d)=4 from 0^+.
2746	$5/2^-,7/2^-$		E	Jπ: L(d,p)=3 from 0^+.
2820 *15*	$5/2^-,7/2^-$		E	Jπ: L(d,p)=3 from 0^+.
2850	$(3/2^+,5/2^+)$		H	Jπ: L(p,d)=(2) from 0^+; 1970Ca01 in (p,d) suggest J=(3/2) from possible J-dependence of $\sigma(\theta)$.
2950 *20*	$7/2^+,9/2^+$		J	Jπ: L(d,t)=4 from 0^+.
3040 *15*	$5/2^-,7/2^-$		E H	XREF: H(3020). Jπ: L(d,p)=3 from 0^+.
3073	$(5/2^-,7/2^-)$		E	Jπ: L(d,p)=(3) from 0^+.
3113	$5/2^-,7/2^-$		E	Jπ: L(d,p)=3 from 0^+.
3151.6 *21*	$(7/2)^-$		B E h	XREF: B(?)h(3160). Jπ: L(d,p)=3 from 0^+; IAR of 17376, $(7/2^-)$ level in ^{123}Sb in ^{122}Sn(pol p,p) IAR.
3188	$(1/2^-,3/2,5/2^+)$		E h	XREF: h(3160). Jπ: L(d,p)=1,2 from 0^+.
3217	$5/2^-,7/2^-$		E	Jπ: L(d,p)=3 from 0^+.
3240	$3/2^+,5/2^+$		e H	XREF: e(3252). Jπ: L(p,d)=2 from 0^+; 1970Ca01 in (p,d) suggest J=3/2 from possible J-dependence of $\sigma(\theta)$.
3259 *3*			B e	XREF: e(3252).
3292.9[a] *3*	$(27/2^+)$@		LM	Jπ: band assignment.
3306? *3*			B h	XREF: h(3300).
3320	$(3/2^-)$		E h	XREF: h(3300). Jπ: IAR of 17563, $(3/2^-)$ level in ^{123}Sb in ^{122}Sn(pol p,p) IAR.
3345 *15*	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3383 *15*	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3435	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3456	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3514			E	
3534	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3551	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3632	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.
3650	$(1/2^-,3/2,5/2^+)$		E	Jπ: L(d,p)=1,2 from 0^+.

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Adopted Levels, Gammas (continued)

^{123}Sn Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
3677			E	
3694			E	
3720	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
3735			E	
3755.7[&] *4*	(31/2⁻)[@]		LM	XREF: M(?). Jπ: band assignment.
3773	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
3809	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
3818.3? *5*	(31/2⁻)		M	XREF: M(?). Jπ: proposed in (^{12}C,Fγ).
3827	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
3849	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
3868			E	
3910	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
3966	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
4008	(1/2⁻)		E	Jπ: Possibly IAR of 18256, (1/2)⁻ level in ^{123}Sb in ^{122}Sn(pol p,p).
4057	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
4075	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
4105			E	
4116.7[a] *4*	(31/2⁺)[@]		LM	Jπ: band assignment.
4267	(1/2⁻,3/2,5/2⁺)		E	Jπ: L(d,p)=1,2 from 0⁺.
4358	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
4378.4[a] *4*	(35/2⁺)[@]	4 ns *1*	LM	Jπ: band assignment. $T_{1/2}$: from γγ(θ) in (^{48}Ca,Xγ).
4423	5/2⁻,7/2⁻		E	Jπ: L(d,p)=3 from 0⁺.
4464			E	
4736			E	
4743.8[&] *5*	(35/2⁻)[@]		LM	XREF: M(?). Jπ: band assignment.
4773 *15*			E	
4809.9? *6*	(35/2⁻)		M	Jπ: proposed in (^{12}C,Fγ).
4845 *15*			E	
4875 *15*			E	
4923 *15*			E	
4964 *15*			E	
5019 *15*			E	
5127 *15*			E	
5478.8[&] *6*	(39/2⁻)[@]		LM	XREF: M(?). Jπ: band assignment.
5520.4? *7*			M	
5640[#]			H	E(level): in energy region of 3830-7000, Γ=1.90 MeV in (p,d) (1986Ma37).
5644.5 *5*	(39/2⁺)		LM	Jπ: proposed in (^{48}Ca,Xγ).
5945.9[‡]	3/2		C	Jπ: from γ(θ) in (n,γ) E=res (1975Bh01).
5946.1[‡]	1/2		C	Jπ: from γ(θ) in (n,γ) E=res (1975Bh01).
5947.5[‡]			C	
5947.9[‡]			C	
5948.9[‡]			C	
5949.2[‡]			C	
5950.6[‡]			C	
6231.1 *5*	(39/2⁺)		LM	Jπ: proposed in (^{48}Ca,Xγ) and (^{12}C,Fγ).
6330[#]			H	E(level): in energy region of 3830-8200, Γ=2.60 MeV in (p,d) (1986Ma37).

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Adopted Levels, Gammas (continued)

^{123}Sn Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
6900[#]			H	E(level): in energy region of 3830-10020, Γ=3.89 MeV in (p,d) (1986Ma37).
7120[#]			H	E(level): in energy region of 3830-10020, Γ=3.68 MeV in (p,d) (1986Ma37).
7159.7 *5*	(43/2$^+$)		LM	
8520[#]			H	E(level): for energy region of 7000-10020, Γ=2.02 MeV in (p,d) (1986Ma37).
9040[#]			H	E(level): for energy region of 8200-10020, Γ=1.20 MeV in (p,d) (1986Ma37).
16943 *50*	9/2$^+$	39 keV *8*	I	Jπ: IAS ^{123}In g.s.
17306 *50*	1/2$^-$	45 keV *7*	I	Jπ: IAS ^{123}In 327-keV state.
17656 *50*	(3/2)$^-$	39 keV *15*	I	Jπ: IAS ^{123}In 698-keV state.

† From a least-squares fit to γ-ray energies where available, unless otherwise noted.
‡ From (n,γ) E=res, obtained from S(n)+E_n(res).
# Quoted values are average excitation energies in 1986Ma37 in (p,d), calculated using strength functions in the indicated energy region in comments.
@ Proposed by 2016Is03 in (^{40}Ca,Xγ), based on observed linking transitions, de-excitation paths, and systematics of level energies over the entire Sn isotopic chain.
& Band(A): Band based on 11/2$^-$. Band proposed in (^{12}C,Fγ) (2012As05) and (^{48}Ca,Xγ) (2016Is03).
a Band(B): Band based on (19/2$^+$) Band proposed in (^{12}C,Fγ) (2012As05).

Adopted Levels, Gammas (continued)

γ(^{123}Sn)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
150.4	1/2$^+$	125.76 *4*	100	24.6	3/2$^+$	M1	0.295	α(K)=0.255 *4*; α(L)=0.0324 *5*; α(M)=0.00636 *9* α(N)=0.001196 *17*; α(O)=0.0001036 *15* E_γ: from ^{123}In β^- decay (47.4 s) (1976Fo02); also quoted in 2007Eg02 in (n,γ) E=th. Other: 125.9 *2* from (d,pγ). Mult.: from ce data in ^{123}In β^- decay (47.4 s) (1976Fo02).
618.88	(9/2)$^-$	619.0 *3*	100	0.0	11/2$^-$	M1,E2	0.0044 *4*	α(K)=0.0038 *3*; α(L)=0.000480 *20*; α(M)=9.4×10^{-5} *4* α(N)=1.76×10^{-5} *8*; α(O)=1.49×10^{-6} *13* E_γ: weighted average of 618.8 *3* from ^{123}In β^- decay (6.15 s), 619.5 *5* from (n,γ) E=res, and 619.0 *3* from (d,pγ).
870.1	(5/2)$^+$	719.5 *8*	12.3 *28*	150.4	1/2$^+$			E_γ: weighted average of 719.0 *10* from (n,γ) E=res and 719.9 *8* from (d,pγ). I_γ: from (d,pγ). Other: 16.3 from (n,γ) E=res.
		845.5 *2*	100 *10*	24.6	3/2$^+$			E_γ: weighted average of 845.5 *2* from ^{123}In β^- decay (6.15 s), 845.0 *5* from (n,γ) E=res, and 845.9 *4* from (d,pγ). I_γ: from (d,pγ).
920.0	(3/2)$^+$	769.5 *2*	35 *4*	150.4	1/2$^+$	M1	0.00284	α(K)=0.00247 *4*; α(L)=0.000297 *5*; α(M)=5.80×10^{-5} *9* α(N)=1.094×10^{-5} *16*; α(O)=9.64×10^{-7} *14* E_γ: weighted average of 769.3 *5* from (n,γ) E=res, 769.5 *2* from (n,γ) E=thermal, and 770.3 *9* from (d,pγ). I_γ: from (d,pγ). Other: 33 from (n,γ) E=res.
		896.2 *5*	100 *10*	24.6	3/2$^+$	M1,E2	0.00182 *18*	α(K)=0.00159 *16*; α(L)=0.000193 *16*; α(M)=3.8×10^{-5} *3* α(N)=7.1×10^{-6} *6*; α(O)=6.1×10^{-7} *7* E_γ: weighted average of 896.5 *5* from ^{123}In β^- decay (47.4 s), 895.8 *10* from (n,γ) E=res, and 895.6 *8* from (d,pγ). I_γ: from (d,pγ).
931.4	7/2$^-$	931.2 *8*	100	0.0	11/2$^-$	E2	1.51×10^{-3}	α(K)=0.001310 *19*; α(L)=0.0001620 *23*; α(M)=3.17×10^{-5} *5* α(N)=5.94×10^{-6} *9*; α(O)=5.04×10^{-7} *8* E_γ: weighted average of 931.2 *8* from ^{123}In β^- decay (6.15 s), 930.9 *10* from (n,γ) E=res, and 931.3 *8* from (d,pγ).
1044.3	(7/2)$^+$	174.18 *6*	0.6 *1*	870.1	(5/2)$^+$	[M1,E2]	0.17 *6*	α(K)=0.14 *4*; α(L)=0.024 *12*; α(M)=0.0048 *23* α(N)=0.0009 *4*; α(O)=5.8×10^{-5} *17*
		425.4 *7*	0.5 *3*	618.88	(9/2)$^-$	[E1]	0.00352	B(E1)(W.u.)>6.6×10^{-8} α(K)=0.00306 *5*; α(L)=0.000368 *6*; α(M)=7.16×10^{-5} *11* α(N)=1.342×10^{-5} *20*; α(O)=1.130×10^{-6} *17*
		1019.7 *2*	100 *6*	24.6	3/2$^+$	(E2)	1.23×10^{-3}	B(E2)(W.u.)>0.14 α(K)=0.001070 *15*; α(L)=0.0001312 *19*; α(M)=2.56×10^{-5} *4* α(N)=4.81×10^{-6} *7*; α(O)=4.11×10^{-7} *6* E_γ: weighted average of 1019.7 *2* from ^{123}In β^- decay (6.15 s) and 1020.0 *10* from (d,pγ). Mult.: M1,E2 from ce data in (d,pγ) and ^{123}In β^- decay (6.15 s); E2 consistent with ΔJ^π.
1072.0	(1/2,3/2)$^+$	921.9 *5*	100 *9*	150.4	1/2$^+$	M1+E2	0.00171 *17*	α(K)=0.00149 *15*; α(L)=0.000181 *15*; α(M)=3.5×10^{-5} *3*

$^{123}_{50}Sn_{73}$-6

Adopted Levels, Gammas (continued)

γ(^{123}Sn) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
								α(N)=6.6×10^{-6} *6*; α(O)=5.7×10^{-7} *6* E_γ: weighted average of 921.9 *5* from (n,γ) E=res and 920.9 *8* from (d,pγ). I_γ: from (d,pγ).
1072.0	(1/2,3/2)$^+$	1046.4 *10*	88 *22*	24.6	3/2$^+$			E_γ: weighted average of 1046.8 *10* from (n,γ) E=res and 1046 *1* from (d,pγ). I_γ: from (d,pγ). Other: 75 from (n,γ) E=res.
1107.04	(15/2$^-$)	1107.0 *1*	100	0.0	11/2$^-$			E_γ: weighted average of 1107.0 *1* from (^{48}Ca,Xγ) and 1106.8 *2* from (^{12}C,Fγ).
1136.3	(1/2,3/2,5/2)$^+$	985.5 *10*		150.4	1/2$^+$			E_γ: weighted average of 985.3 *10* from (n,γ) E=res and 985.6 *10* from (d,pγ). I_γ: this is the only γ seen from 1136 level in (n,γ) E=res and E=th; no Iγ given in (d,pγ).
		1112.0 *9*	100	24.6	3/2$^+$	M1,E2	0.00113 *11*	α(K)=0.00098 *10*; α(L)=0.000118 *10*; α(M)=2.30×10^{-5} *20* α(N)=4.3×10^{-6} *4*; α(O)=3.8×10^{-7} *4*; α(IPF)=6.8×10^{-7} *6* E_γ,I_γ: seen in (d,pγ) only (1976Ma09).
1155.03	7/2$^+$	223.5 *5*	0.19 *7*	931.4	7/2$^-$	[E1]	0.0189	B(E1)(W.u.)>2.7×10^{-7} α(K)=0.0165 *3*; α(L)=0.00201 *3*; α(M)=0.000392 *6* α(N)=7.30×10^{-5} *12*; α(O)=5.93×10^{-6} *9*
		284.7 *2*	0.27 *7*	870.1	(5/2)$^+$	[M1,E2]	0.037 *5*	α(K)=0.032 *4*; α(L)=0.0045 *10*; α(M)=0.00089 *21* α(N)=0.00017 *4*; α(O)=1.27×10^{-5} *14*
		536.4 *3*	1.4 *2*	618.88	(9/2)$^-$	[E1]	0.00202	B(E2)(W.u.)>2.0×10^{-7} α(K)=0.001764 *25*; α(L)=0.000211 *3*; α(M)=4.10×10^{-5} *6* α(N)=7.69×10^{-6} *11*; α(O)=6.54×10^{-7} *10*
		1130.5 *2*	100 *6*	24.6	3/2$^+$	E2	0.000987 *14*	B(E2)(W.u.)>0.082 α=0.000987 *14*; α(K)=0.000857 *12*; α(L)=0.0001041 *15*; α(M)=2.03×10^{-5} *3* α(N)=3.82×10^{-6} *6*; α(O)=3.28×10^{-7} *5*; α(IPF)=1.320×10^{-6} *21* Mult.: from ce data in ^{123}In β^- decay (6.15 s).
		1155.2 *8*	0.06 *3*	0.0	11/2$^-$	[M2]	0.00264	α(K)=0.00229 *4*; α(L)=0.000282 *4*; α(M)=5.53×10^{-5} *8* α(N)=1.042×10^{-5} *15*; α(O)=9.17×10^{-7} *13*; α(IPF)=3.94×10^{-7} *12* B(M2)(W.u.)>0.0017
1194.6	(5/2)$^+$	1170.0 *5*	100	24.6	3/2$^+$	M1,E2	0.00101 *10*	α(K)=0.00088 *9*; α(L)=0.000105 *9*; α(M)=2.06×10^{-5} *18* α(N)=3.9×10^{-6} *4*; α(O)=3.4×10^{-7} *4*; α(IPF)=3.5×10^{-6} *3* E_γ: weighted average of 1170 *1* from ^{123}In β^- decay (47.4 s), 1169.8 *5* from (n,γ) E=res, and 1170.8 *10* from (d,pγ).
1217.07	(13/2$^-$)	1217.1 *1*	100	0.0	11/2$^-$			
1488.8	(5/2)$^+$	1464.2[a] *10*	100	24.6	3/2$^+$			E_γ: from (d,pγ).
1926.09	(15/2$^+$)	709.0 *1*	100 *13*	1217.07	(13/2$^-$)			E_γ,I_γ: from (^{40}Ca,Xγ).
		819.1 *2*	80 *13*	1107.04	(15/2$^-$)			E_γ,I_γ: from (^{40}Ca,Xγ).

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Adopted Levels, Gammas (continued)

γ(^{123}Sn) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
1944.89	(19/2$^+$)	(18.7)		1926.09	(15/2$^+$)	[E2]	1250	α(L)=1006 *14*; α(M)=207 *3* α(N)=35.5 *5*; α(O)=0.744 *11* E_γ: from level-energy difference.
		728.0 *2*	9.0 *15*	1217.07	(13/2$^-$)	[E3]	0.00642	B(E3)(W.u.)=0.14 *+8–4* α(K)=0.00544 *8*; α(L)=0.000794 *12*; α(M)=0.0001573 *22* α(N)=2.92×10^{-5} *4*; α(O)=2.28×10^{-6} *4*
		837.8 *1*	100 *8*	1107.04	(15/2$^-$)	[M2]	0.00608	B(M2)(W.u.)=3.7×10^{-4} *+19–10* α(K)=0.00526 *8*; α(L)=0.000663 *10*; α(M)=0.0001302 *19* α(N)=2.45×10^{-5} *4*; α(O)=2.14×10^{-6} *3*
2001.2	(9/2)$^+$	957.3 *5*	36 *9*	1044.3	(7/2)$^+$			
		1131 *2*	≈18	870.1	(5/2)$^+$			
		1382.3 *2*	100 *6*	618.88	(9/2)$^-$			
		2001.2 *4*	24 *6*	0.0	11/2$^-$			
2098.97	(19/2$^-$)	992.0 *2*	100	1107.04	(15/2$^-$)			E_γ: from (^{40}Ca,Xγ).
2152.64	(23/2$^+$)	207.6 *2*	100	1944.89	(19/2$^+$)	[E2]	0.1224	B(E2)(W.u.)=0.006 α(K)=0.1003 *15*; α(L)=0.0178 *3*; α(M)=0.00356 *6* α(N)=0.000647 *10*; α(O)=4.05×10^{-5} *6*
2156.0	(1/2,3/2,5/2)	1019.7 *1*	100	1136.3	(1/2,3/2,5/2)$^+$			E_γ: from (n,γ) E=thermal. Others: 1019.5 *10* from (n,γ) E=res.
2262.78	(19/2$^-$)	1155.7 *2*	100	1107.04	(15/2$^-$)			E_γ: weighted average of 1155.7 *2* from (^{48}Ca,Xγ) and 1155.6 *2* from (^{12}C,Fγ).
2395.29	(21/2$^+$)	242.6 *2*	88 *8*	2152.64	(23/2$^+$)			
		296.1 *5*	8 *3*	2098.97	(19/2$^-$)			
		450.5 *2*	100 *8*	1944.89	(19/2$^+$)			
2542.26	(23/2$^-$)	147.0 *2*	100 *11*	2395.29	(21/2$^+$)			
		279.4 *3*	34 *4*	2262.78	(19/2$^-$)			E_γ: weighted average of 279.6 *2* from (^{48}Ca,Xγ) and 279.1 *2* from (^{12}C,Fγ).
		443.4 *2*	11 *2*	2098.97	(19/2$^-$)			
2621.0?	(1/2$^+$)	2469 *3*	44 *27*	150.4	1/2$^+$			E_γ,I_γ: from ^{123}In β^- decay (47.4 s).
		2598 *3*	100 *39*	24.6	3/2$^+$			E_γ,I_γ: from ^{123}In β^- decay (47.4 s).
2712.3	(27/2$^-$)	170.1 *2*		2542.26	(23/2$^-$)			E_γ: weighted average of 170.2 *1* from (^{48}Ca,Xγ) and 169.8 *2* from (^{12}C,Fγ).
		559.5		2152.64	(23/2$^+$)			
3151.6	(7/2)$^-$	3127 *2*	100	24.6	3/2$^+$			E_γ: from ^{123}In β^- decay (47.4 s).
3259		3103[a] *3*	31 *10*	150.4	1/2$^+$			
		3234 *3*	100 *25*	24.6	3/2$^+$			
3292.9	(27/2$^+$)	1140.2 *2*	100	2152.64	(23/2$^+$)			E_γ: weighted average of 1140.3 *2* from (^{48}Ca,Xγ) and 1140.0 *3* from (^{12}C,Fγ).
3306?		3155[a] *3*	100	150.4	1/2$^+$			E_γ: from ^{123}In β^- decay (47.4 s).
3755.7	(31/2$^-$)	1043.7 *3*	100	2712.3	(27/2$^-$)			E_γ: weighted average of 1043.8 *3* from (^{48}Ca,Xγ) and 1043.5 *3* from (^{12}C,Fγ).
3818.3?	(31/2$^-$)	1107.0[a] *3*	100	2712.3	(27/2$^-$)			E_γ: from (^{12}C,Fγ).
4116.7	(31/2$^+$)	361.6 *5*	10 *5*	3755.7	(31/2$^-$)			E_γ,I_γ: from (^{48}Ca,Xγ).
		823.7 *2*	100 *9*	3292.9	(27/2$^+$)			E_γ: weighted average of 823.8 *2* from (^{48}Ca,Xγ) and 823.6 *3*

$^{123}_{50}Sn_{73}$-8

Adopted Levels, Gammas (continued)

γ(^{123}Sn) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
								from (^{12}C,Fγ).
								I_γ: from (^{48}Ca,Xγ).
4378.4	(35/2$^+$)	261.7 *2*	100	4116.7	(31/2$^+$)	[E2]	0.0557	B(E2)(W.u.)=3.0 *+10−6* α(K)=0.0464 *7*; α(L)=0.00748 *11*; α(M)=0.001488 *22* α(N)=0.000272 *4*; α(O)=1.85×10^{-5} *3* E_γ: weighted average of 261.8 *2* from (^{48}Ca,Xγ) and 261.4 *3* from (^{12}C,Fγ).
4743.8	(35/2$^-$)	988.0 *3*	100	3755.7	(31/2$^-$)			E_γ: weighted average of 988.1 *3* from (^{48}Ca,Xγ) and 987.8 *3* from (^{12}C,Fγ).
4809.9?	(35/2$^-$)	991.6[a] *3*		3818.3?	(31/2$^-$)			E_γ: from (^{12}C,Fγ) only.
5478.8	(39/2$^-$)	735.0 *3*	100	4743.8	(35/2$^-$)			E_γ: weighted average of 734.9 *4* from (^{48}Ca,Xγ) and 735.0 *3* from (^{12}C,Fγ).
5520.4?		710.5[a] *3*		4809.9?	(35/2$^-$)			E_γ: from (^{12}C,Fγ) only.
5644.5	(39/2$^+$)	1266.0 *3*	100	4378.4	(35/2$^+$)			E_γ: weighted average of 1266.1 *3* from (^{48}Ca,Xγ) and 1265.8 *4* from (^{12}C,Fγ).
5945.9	3/2	3331[@] *3*	3.5[@] *7*	2615.2	(1/2$^+$)			
		3789.1[@] *25*	9.9[@] *14*	2156.0	(1/2,3/2,5/2)			
		4750.8[@] *25*		1194.6	(5/2)$^+$			
		4874.2[@] *25*		1072.0	(1/2,3/2)$^+$			
		5025.7[@] *25*	14.1[@] *14*	920.0	(3/2)$^+$			
		5076.2 *15*	14.1[@] *14*	870.1	(5/2)$^+$			
		5795.5 *15*	100[@] *3*	150.4	1/2$^+$			
		5921.0 *15*	34.5[@] *14*	24.6	3/2$^+$			
5946.1	1/2	3331[#]		2615.2	(1/2$^+$)			
		4873.9[#]	13[@] *2*	1072.0	(1/2,3/2)$^+$			
		5026.2[#]	31[@] *3*	920.0	(3/2)$^+$			
		5076.4[#]		870.1	(5/2)$^+$			
		5795.6[#]	100[@] *4*	150.4	1/2$^+$			
5947.5		5077.8[#]		870.1	(5/2)$^+$			
		5922.7[#]		24.6	3/2$^+$			
5947.9		5923.1[#]	100	24.6	3/2$^+$			
5948.9		5924.1[#]	100	24.6	3/2$^+$			
5949.2		5079.5[#]	90[@] *10*	870.1	(5/2)$^+$			
		5798.7[#]	100[@] *5*	150.4	1/2$^+$			
		5924.4[#]		24.6	3/2$^+$			
5950.6		4756.1[#]	36[@] *10*	1194.6	(5/2)$^+$			
		5925.8[#]	100[@] *15*	24.6	3/2$^+$			

$^{123}_{50}Sn_{73}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{123}Sn)$ (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Comments
6231.1	$(39/2^+)$	1852.7 *3*	100	4378.4	$(35/2^+)$	E_γ: weighted average of 1852.6 *3* from (^{48}Ca,Xγ) and 1853.0 *5* from (^{12}C,Fγ).
7159.7	$(43/2^+)$	928.6 *3*	67 *17*	6231.1	$(39/2^+)$	E_γ: weighted average of 928.7 *3* from (^{48}Ca,Xγ) and 928.3 *4* from (^{12}C,Fγ). I_γ: weighted average of 83 *17* from (^{48}Ca,Xγ) and 50 *17* from (^{12}C,Fγ).
		1515.1 *3*	100 *17*	5644.5	$(39/2^+)$	E_γ: weighted average of 1515.0 *3* from (^{48}Ca,Xγ) and 1515.3 *5* from (^{12}C,Fγ). I_γ: from (^{48}Ca,Xγ). Other: 100 *33* from (^{12}C,Fγ).

† Additional information 3.
‡ From ^{123}In β^- decays (6.15 s) for γ rays from levels with J<11/2 (up to 2001 level) and from (^{40}Ca,Xγ) for J>11/2 (up to 7160 level), unless otherwise noted.
# From level-energy differences, seen in (n,γ) E=res.
@ From (n,γ) E=res.
& From ce data in (d,pγ) (1976Ma09), unless otherwise noted.
a Placement of transition in the level scheme is uncertain.

$^{123}_{50}Sn_{73}$-10

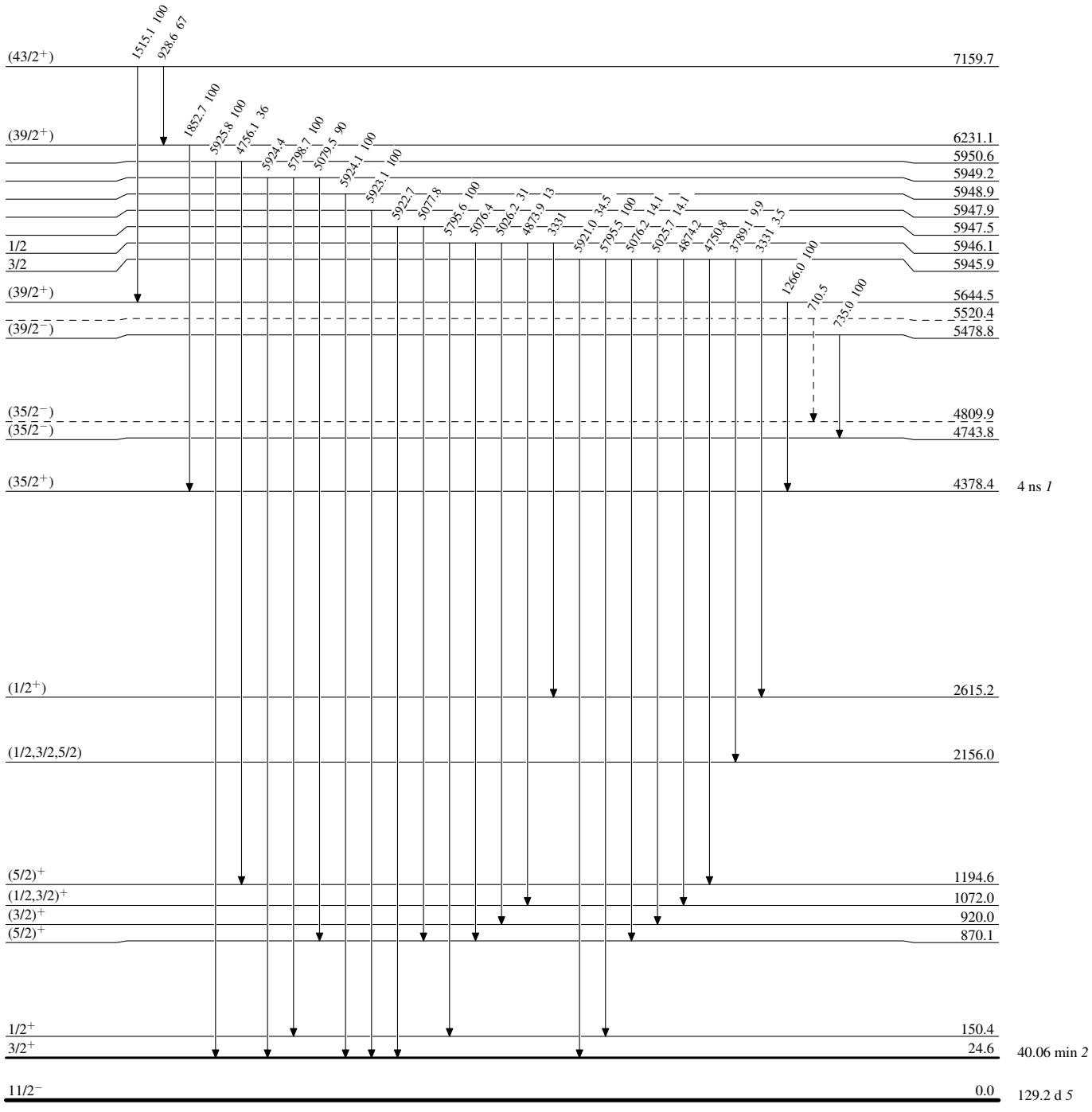
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{123}_{50}Sn_{73}$

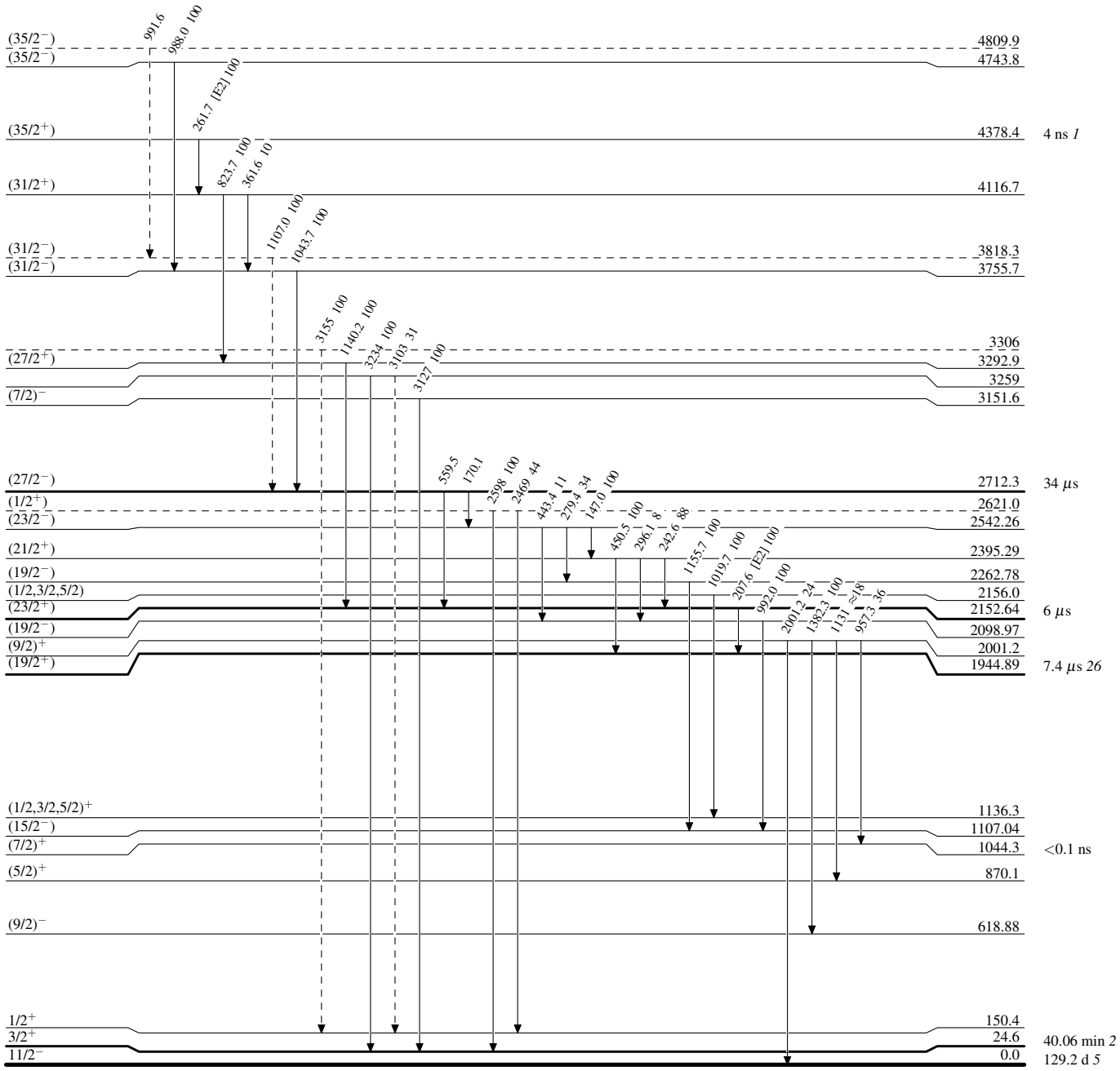
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{123}_{50}Sn_{73}$

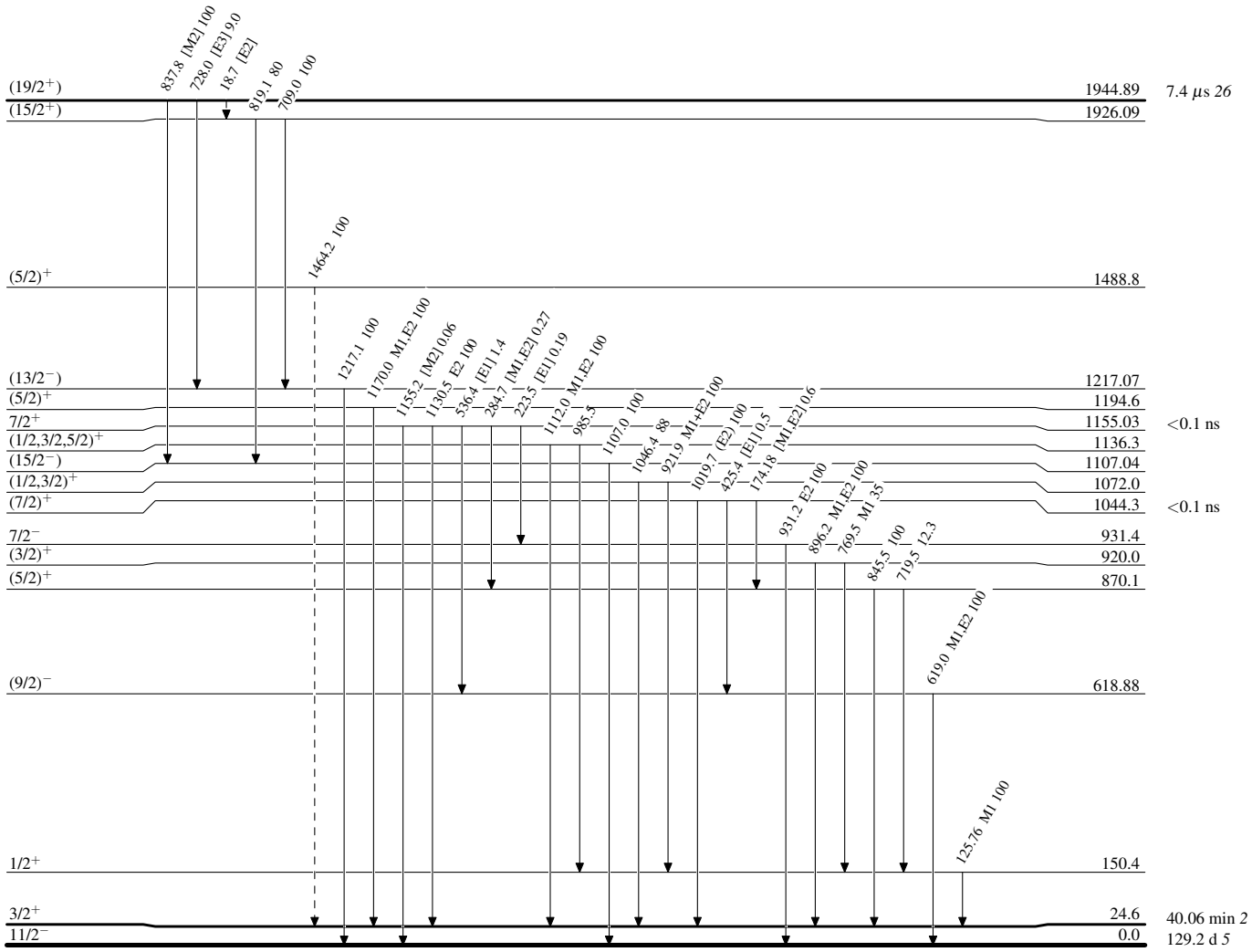
Adopted Levels, Gammas

Legend

Level Scheme (continued)

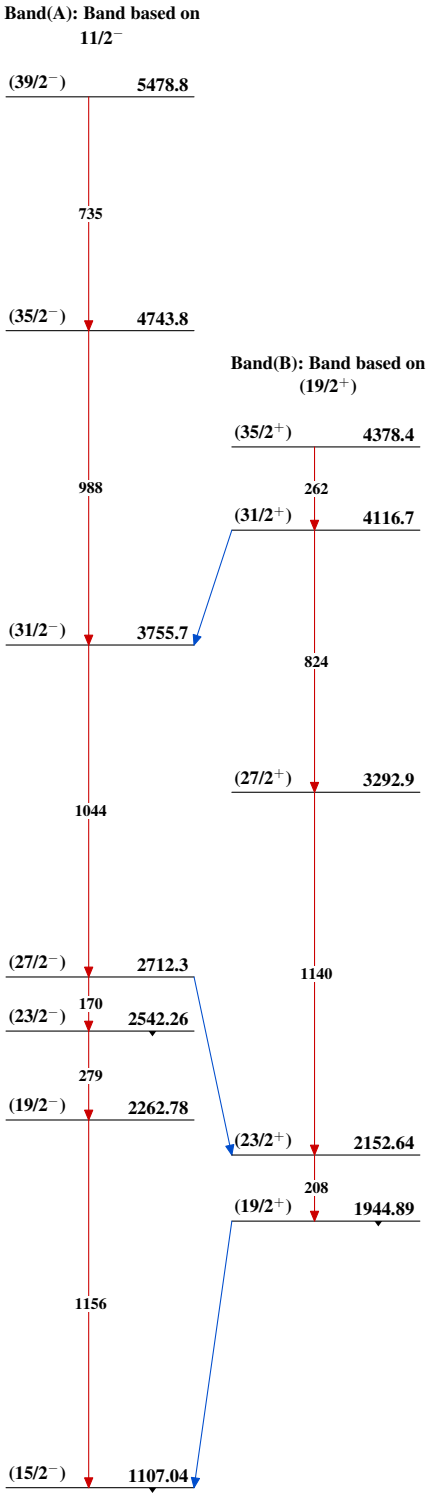
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{123}_{50}Sn_{73}$

Adopted Levels, Gammas



$^{123}_{50}Sn_{73}$